## CLAIMS

What is claimed is:

1. A packet optimization method comprising:

generating a metric to indicate a channel condition;

processing the metric to determine optimal packet-size for the channel condition; and

choosing the optimal packet-size corresponding to the processed metric to send to a requestor.

2. The packet optimization method of claim 1, wherein processing further includes:

receiving the metric corresponding to the channel condition; and

using the received metric to balance a trade-off between the cyclic redundancy check and re-transmission overhead.

3. The packet optimization method of claim 1, wherein choosing the optimal packet further includes training a neural network or look-up table to optimally improve system data throughput by selecting a packet corresponding to the channel condition.

4. The packet optimization method of claim 1, wherein the optimal packet-size being a packet-size that minimizes both cyclic redundancy check and re-transmission overhead.

5. The packet optimization method of claim 1, wherein the metric being a frame error rate

6. The packet optimization method of claim 1, wherein the metric being a function of a packet error rate selected from a group consisting of frame error

rate (FER), signal to noise ratio estimate (SNR), energy per bit (Eb) / Thermal noise (Nt) estimate, and system time or finger time drift rate.

7. An apparatus comprising:

a memory to store a metric and packet; and

a processor to generate a metric indicating a channel condition, to process the metric to determine optimal packet-size for the channel condition, and to choose the optimal packet-size corresponding to the processed metric to send to a requestor.

8. The apparatus of claim 7, wherein the processor is to receive the metric corresponding to the channel condition, and use the received metric to balance trade-off between the cyclic redundancy check and re-transmission overhead.

9. The apparatus of claim 7, wherein the processor is to train a neural network or look-up table to optimally improve system data throughput by selecting a packet corresponding to the channel condition.

10. The apparatus of claim 7, wherein the processor is to choose an optimal packet-size that minimizes both cyclic redundancy check and re-transmission overhead.

11. The apparatus of claim 7, wherein the processor is to use the metric corresponding to frame error rate

12. The apparatus of claim 7, wherein the metric being a function of a packet error rate selected from a group consisting of frame error rate (FER), signal to noise ratio estimate (SNR), energy per bit (Eb) / Thermal noise (Nt) estimate, and system time or finger time drift rate.

13. A storage medium having stored therein a plurality of machine executable instructions, wherein when executed, the instructions perform a method comprising:

generating a metric to indicate a channel condition;

processing the metric to determine optimal packet-size for the channel condition; and

choosing the optimal packet-size corresponding to the processed metric to send to a requestor.

14. The storage medium of claim 13, wherein processing further includes:

receiving the metric corresponding to the channel condition; and

using the received metric to balance trade-off between the cyclic redundancy check and re-transmission overhead.

15. The storage medium of claim 13, wherein choosing the optimal packet further includes training a neural network or look-up table to optimally improve system data throughput by selecting a packet corresponding to the channel condition.

16. A method of preventing system overload in a base station or mobile data transmission system comprising:

estimating likelihood of packet transmission error in a system;

determining a radio link protocol (RLP) packet-size corresponding to the estimated likelihood of packet transmission error; and

sending the RLP packet to a base station or mobile data transmission system.

17. The method of claim 16, wherein determining the RLP packet-size further includes:

allowing a base station or mobile data transmission system to request a change for the RLP packet-size;

selecting a RLP packet from a predetermined table that corresponds in size to the size requested by the base station or mobile data transmission system; and

sending the selected RLP packet to the base station or mobile data transmission system.

18. The method of claim 17, wherein the base station or mobile data transmission request being limited to a predetermined number of requests.

19. An apparatus comprising:

a memory to store an RLP packet; and

a processor to estimate likelihood of packet transmission error in a system, to determine a radio link protocol (RLP) packet-size corresponding to the estimated likelihood of packet transmission error, and to send the RLP packet to a base station or mobile data transmission system.

20. The apparatus of claim 19, wherein the processor is to allow a base station or mobile data transmission system to request a change for the RLP packet-size, to select a RLP packet from a predetermined table that corresponds in size to the size requested by the base station or mobile data transmission system, and to send the selected RLP packet to the base station or mobile data transmission system.

21. The apparatus of claim 20, wherein the processor is to limit the request from the base station or mobile data transmission to a predetermined number of requests.

22. A storage medium having stored therein a plurality of machine executable instructions, wherein when executed, the instructions perform a method comprising:

estimating likelihood of packet transmission error in a system;

determining a radio link protocol (RLP) packet-size corresponding to the estimated likelihood of packet transmission error; and

sending the RLP packet to a base station or mobile data transmission system.

23. The storage medium of claim 22, wherein determining the RLP packet-size further includes:

allowing a base station or mobile data transmission system to request a change for the RLP packet-size;

selecting a RLP packet from a predetermined table that corresponds in size to the size requested by the base station or mobile data transmission system; and

sending the selected RLP packet to the base station or mobile data transmission system.

24. The storage medium of claim 22, wherein the base station or mobile data transmission request being limited to a predetermined number of requests.

25. A method of optimizing packet-size comprising:

storing at least one radio link protocol (RLP) packet in a physical layer; and

predetermining the RLP packet-size by empirical experimentation.

26. The method of claim 25, wherein the empirical experimentation includes

simulating a condition with a particular metric value;

adjusting packet-size manually corresponding to the metric value; and

recording packet-size data for the metric value to obtain maximum system throughput.

27. The method of claim 25, wherein the predetermining further includes storing a metric value in a lookup table and obtaining an optimum packet-size corresponding to the stored metric value.

28. The method of claim 25, wherein the RLP packet includes cyclic redundancy check bits to provide error-checking capability for the RLP packet.

29. An apparatus comprising:

a memory to store an radio link protocol (RLP) packet, and empirical experimentation data;

a processor to store at least one RLP packet in a physical layer, and to predetermine the RLP packet-size by empirical experimentation.

30. The apparatus of claim 29, wherein the processor to perform empirical experimentation is to simulate a condition with a particular metric value, to adjust packet-size manually corresponding to the metric value, and to record packet-size data for the metric value for obtaining maximum system throughput.

31. The apparatus of claim 29, wherein the processor is to store a metric value in a lookup table and is to obtain an optimum packet-size corresponding to the stored metric value.

32. The apparatus of claim 29, wherein the RLP packet includes cyclic redundancy check bits to provide error-checking capability for the RLP packet.

33. A storage medium having stored therein a plurality of machine executable instructions, wherein when executed, the instructions perform a method comprising:

storing at least one radio link protocol (RLP) packet in a physical layer; and

predetermining the RLP packet-size by empirical experimentation.

34. The storage medium of claim 33, wherein the empirical experimentation includes

simulating a condition with a particular metric value;

adjusting packet-size manually corresponding to the metric value; and

recording packet-size data for the metric value to get maximum system throughput.

35. The storage medium of claim 33, wherein the predetermining further includes storing a metric value in a lookup table and obtaining an optimum packet-size corresponding to the stored metric value.

36. The storage medium of claim 33, wherein the RLP packet includes cyclic redundancy check bits to provide error-checking capability for the RLP packet.